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Headrest for a vehicle seat

The invention relates to a headrest for a vehicle seat, with a stationary support part and an impact element which can be moved relative to the latter, in accordance with the precharacterizing clause of patent claim 1.

A headrest of the generic type is known from DE 102 02 598 A1. The known headrest is distinguished by a stationary support part and an impact element which can be moved relative to the latter. Support part and impact element are connected to each other via upper and lower levers which form four-bar linkages. The moving of the impact element relative to the stationary support part takes place via a pivoting of the levers and therefore via an actuation of the four-bar linkage. In the case of the known headrest, the pivoting of the impact element relative to the stationary support part takes place in two different situations. Firstly, by pulling the impact element forward, the desired distance for comfort reasons between head and headrest can be set. For this purpose, a locking device is provided which locks the four-bar linkages and thereby keeps the impact element in a position once it is set. Secondly, a moving of the impact element can take place when induced by a crash. This movement also takes place via the four-bar linkage described previously. While the adjustment for comfort purposes is carried out manually, the crash-active adjustment takes place with the aid of a drive.

The present invention is based on the object of providing a headrest for a vehicle seat with a stationary support part and an impact element which can be moved relative to the latter, which headrest can be produced in a more simple and therefore more cost-

effective manner.

This object is achieved by the features of patent claim 1.

The solution according to the invention is accordingly distinguished in that a lever system provided between the impact element and support part can be at least partially decoupled. This provides the possibility, in comparison to the prior art, of realizing different sequences of movement between support part and impact element. This affords the advantage that a different sequence of movement can be realized depending in each case on the reason for which a movement of the impact element relative to the stationary support part takes place. The independence of the sequences of movement depending in each case on the triggering reason gives rise to the possibility of setting each sequence of movement separately and therefore of providing an ideal sequence of movement for each triggering situation. Added to this is the fact that the provision of two different locking systems can be dispensed with.

According to an embodiment, the impact element is mounted on the support part via at least one lower lever and one upper lever. The connection via two levers constitutes a simple lever system which can be designed sufficiently robustly in order to absorb the forces acting on the impact element during an accident.

It is conceivable to provide a respective pair of levers at the bottom and top, as a result of which the mounting of the movable impact element becomes more stable. The use of pairs of levers therefore supports a robust and therefore reliable mounting of the impact element on the stationary support component. The upper and lower levers can be mounted pivotably in each case both on the stationary support part and on the movable

impact element, so that they in each case form a four-bar linkage.

According to an embodiment, a hinge point of the four-bar linkage is mounted displaceably. A displaceable mounting of a hinge point of the four-bar linkage results in the possibility of decoupling the four-bar linkage and therefore of realizing different sequences of movement via the same lever arrangement. If the displaceably mounted hinge point of the four-bar linkage is locked, the sequence of movement is characterized by a pivoting of the levers about the four-bar linkages, so that the movement of the impact element relative to the stationary support part is distinguished by a combination of a pivoting movement with a translation movement. Depending in each case on the arrangement of the levers, the impact element can thereby be displaced forward, i.e. in the direction of the vehicle occupant's head, and also downward or upward. When the locking of the displaceably mounted hinge point of the four-bar linkage is canceled, a sequence of movement which is different therefrom arises, which is distinguished by a pivoting of at least one lever with the impact plate about a hinge point. This type of movement makes it possible both to set the distance of the impact element with respect to a vehicle occupant's head and the inclination of the impact element.

The displaceably mounted hinge point can be designed as a bolt which is mounted in an elongated hole. In order to realize the possibility of locking the hinge point in the mounting, the bolt can be pressed into the elongated hole. As a result, the elongated hole puts up a defined frictional value against the bolt. In order to adjust the hinge point in the elongated hole, a minimum force has first of all to be overcome. This arrangement affords the advantage that it can be

produced in a simple and material-saving manner. It constitutes a simple possibility of locking a hinge point in a mounting.

The different sequences of movement can be realized for moving the impact element in different situations. For example, the impact element can be transferred from a normal position into a protective position. When a protective position is spoken of within the context of the invention, this means the position which the impact element assumes in the event of an accident in order to protect the vehicle occupant against injuries. The protective position is defined here in such a manner that it prevents a vehicle occupant's head from swinging back in the event of an accident and therefore prevents injuries.

The transfer from the normal position into the protective position can take place via the four-bar linkage. The pivoting via the four-bar linkage affords the advantage that a reliable and specifically previously determinable displacement of the impact element relative to the stationary support part is possible.

According to a further embodiment, the impact element can be adjusted in its normal position for comfort reasons. In this case, the adjustment can take place via the decoupled four-bar linkage. For example, the comfort adjustment can take place via a displacement of the displaceably mounted hinge point of the four-bar linkage. In this case, the sequence of movement described in conjunction with claim 5 arises.

Further advantageous refinements can be gathered from the further subclaims.

The invention is shown below with reference to the

exemplary embodiment which is illustrated in the figures, in which:

Fig. 1 shows a diagrammatic sectional illustration of a headrest according to the invention in a normal position, and

Fig. 2 shows a diagrammatic sectional illustration according to figure 1 in a normal position which has been adjusted for comfort purposes.

Figure 1 illustrates a headrest 1. The headrest 1 is fastened to a seat (not illustrated) via headrest rods 2. It has a support part 3 which is connected to the headrest rods 2. The support part 3 has bearing points 4. Furthermore, an impact element 5 is provided.

The impact element 5 comprises a supporting body 6 and a cushion 8 which is connected to the supporting body 6 via connecting webs 7. Bearings 9, 11 for hinge points are likewise provided on the supporting body 6. The impact element 5 is connected to the support part 3 via an upper lever 12 and a lower lever 13. The lever 12 extends from the upper bearing 4 on the support part 3 as far as the upper bearing 9 on the impact element 5. The lever 13 extends from the lower bearing 4 on the support part 3 as far as the lower bearing 11 on the impact element 5. The bearings accommodate rotary joints which may be composed of bolts, for example.

Only one upper lever 12 and one lower lever 13 are in each case illustrated in the figures. However, it is also conceivable for a respective pair of levers to be provided at the top and bottom. Only the levers 12 and 13 which are illustrated are described below.

The lower bearing 11 on the impact element 5 is distinguished in that it is in the form of an elongated

hole. A bolt 15 forming the lower joint of the lower lever 13 is mounted in this elongated hole. By means of this elongated hole, it is possible to displace the bolt 15 in the bearing 11, i.e. relative to the impact element 5. The remaining hinge points in the bearings 4 and 9 are designed as a fixed position. The bolts forming the hinge points are not mounted displaceably.

The functioning of the headrest according to the invention will be described in more detail below:

Owing to the decoupling according to the invention of the lever system 12, 13 connecting the stationary support part 3 and the movable impact element 5, the movable impact element 5 can carry out different sequences of movement. One sequence of movement is carried out if a vehicle occupant adjusts the headrest for comfort reasons. Another sequence of movement is carried out if the headrest 1 is transferred from its normal position into a protective position in the event of an accident.

The adjustment for comfort purposes is described first of all below. If a vehicle occupant would like to adjust the impact element 5 for comfort reasons, he can do this by applying a force in the direction of the arrow A in figure 1. This application of force has the result that the impact element 5 is rotated by the upper lever 12 about the upper hinge point 4 on the stationary support part 3. The maximum adjustment distance of a rotational movement of this type is predetermined by the length of the elongated hole 11. In the exemplary embodiment illustrated, the maximum angle of adjustment corresponds to the angle α shown. The comfort adjustment is an inclination adjustment which proceeds from a pivoting about the pivot point 4 of the upper lever 12. For this purpose, the elongated hole 11 is of curved design and has a radius

corresponding to the distance from the upper pivot point 4. The bolt 15 is preferably pressed into the elongated hole 11, as a result of which a defined frictional value is put up against a movement of the bolt 15 in the elongated hole 11, said frictional value enabling the impact element 5 to be locked in any position and therefore enabling an infinitely variable setting of the impact element 5. Of course, any other form of locking the impact element 5 relative to the lower lever 13 is also conceivable. The elongated hole 11 may also be of profiled design, or its walls may be of contoured design, so that a stepwise or latched adjustment is made possible. The adjustment for comfort purposes may also take place with the aid of a drive, for example an electric motor.

In the event of a crash, the displacement of the impact element 5 takes place, as known from the prior art, by simultaneous pivoting of the levers 12, 13 about the hinge points 4. In this case, the impact element 5 pivots forward or upward. The pivoting can take place independently of the inclination which has been set for the impact element 5. A customary locking is provided for this use situation. The drive used may be, for example, a prestressed spring.